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# 「専門家」の家具固定に対する態度：岸和田市における事例研究

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## Characterization of People's Attitudes toward Furniture Fastening Among "Professionals": Case study of Kishiwada, Osaka

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### Synopsis

Furniture fastening is perceived as the easiest and cheapest way of earthquake preparedness. However for some reasons not so many people actually carry out furniture fastening. This study aims in characterization of the attitudes toward furniture fastening as viewed by "professionals". The analytical technique employed for this study is Q-Method – Factor analysis based technique developed for studying subjectivity, attitudes and behaviors. Three types of people, "optimists", "unbelievers" and "lazy" are classified. The proposed approach has been found to address the question: What kind of support is needed by whom if any? The paper concludes with the potential and limitations of the proposed method and refers to further research needed.

**Keywords:** furniture fastening, attitudes, behaviors, earthquake preparedness, Q-Method

### 1. Introduction

According to the recent seismological forecasts a very powerful earthquake (Richter scale 8.0 – 8.3) is expected to strike with a 95 percent probability in the next 50 years in the Tokai, Nankai regions of Japan. That is why the issue of community earthquake preparedness is such a hot topic nowadays in these regions.

Some of the actions are focused on educating of people on how to fix furniture to the walls in order to prevent it from overturning and killing people in the event of earthquake. In spite of the fact that the furniture fastening seems to be a very easy action to perform, for unknown reasons some people do not undertake this action. This study, however, focuses only on "professionals". Their views of people's attitudes and behaviors toward furniture fastening are scientifically analyzed.

Our main goal is to identify and examine the attitudes toward furniture fastening in order to understand the views of professionals in terms of people's motivations and behaviors. For this purpose the action like "furniture fastening" is assumed to be a function of individual attitude based on subjective view. One of the most appropriate methods to study subjectivity is the Q Method which we will describe in the next section.

### 2. Q Method for the study of subjectivity

Q-method was introduced by William Stephenson (1935) in the letter to Nature. Stephenson was a physicist and psychologist working under Charles Spearman, the inventor of factor analysis. Stephenson's most famous book was *The Study of Behavior: Q-technique and its methodology* (1953).

Q-method is very often described as a combination of

qualitative (discourse analysis) and quantitative (q-factor analysis) methods of social sciences. Q-method does not require a big sample of participants – even one is worthy overview – and meaningful, discernible groups can be found with as few as a dozen participants (Richard A. Krueger, Mary Anne Casey, Jonathan Donner, Stuart Kirsch, Jonathan N. Maack, 2001).

Recently the method was re-discovered and applied in many fields as participatory management and communication research. As an example it was applied to study experienced watershed management planners and activists perceive as a proper way to involve the public in decision-making. (Webler, Tuler, 2001)

Usually we distinguish 5 steps in a Q-Method study:

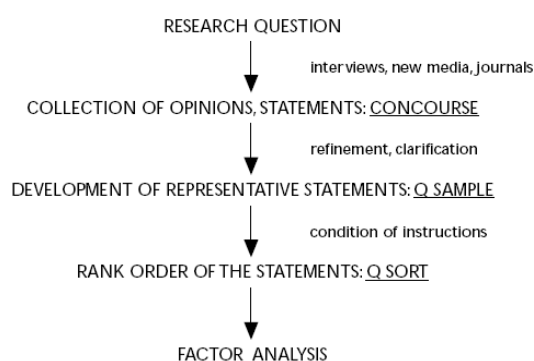


Fig. no. 1 Steps in Q-Method study. (Amin, 2000)

The first step is to formulate the major question to be raised, which in our case is: What are the attitudes and behaviors towards furniture fastening activities?

The second step is called Concourse, the process of collection of opinions, statements related to the research problem. The third step is development of representative sample of statements which is called Q-sample. Each respondent is given the list of statements and is asked to prioritize the statements into his/her individual Q-Sort, which means that he/she has to rearrange the statements into the order from *unlike my feeling* to *like my feeling* (see figure 2 – each number is a number of particular statement) the implicit assumption is that Q-Sort has the shape of the normal distribution.

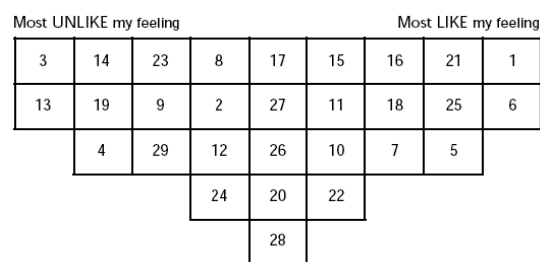


Fig. no. 2. Forced distribution of Q-Sorts (Amin, 2000)

The Q-method is often called an inverted factor analysis. Traditional factor analysis is concerned with a selected population of N individuals each of whom has been measured in M tests. The Q method begins with population of N tests (pictures, essays or any other measurable material), each of which is measured or scaled by individuals (Brown, 2001). Factor analysis is concerned with the measurement of relationships between items, while Q is concerned with identifying similar people on the basis of Q-Sorts.

In other words, factor analysis is based on data matrix of people (rows) and variables (columns) while Q methodology is based on a data matrix of statements (rows) and people (columns). On the basis of this data matrix a correlation matrix is generated in which the correlations in each cell measure the degree of similarity between individual Q-sorts (with coefficients ranging from -1 to +1). Therefore the resulting factors refers to *groups of people* who sorted statements in similar way, not to *latent variables* associated with each of measured variables (Pelletier, D.L., Kraak V. McCullum Ch., Uusitalo Ulla 2000)

### 3. Description of exercise procedure

The question we asked was: *Why people do and do not carry out furniture fastening?* To answer this question, in February 2006 a q-exercise was conducted in order to elicit views and attitudes toward furniture fastening activities among professionals in Kishiwada City, Osaka Prefecture, Japan.

Before the meeting researchers carried out “concourse” (open ended questionnaire) in order to generate representative sample of the statements needed for next step of the research.

A group of respondents consisted of 56 people. 13 of them were professionals related to the field of natural disaster preparedness and response including private

and public administration consultants and employees. The rest of 43 people were representatives and/or members of local citizen's disaster prevention organization (jishubousaisoshiki) but they are not included in this analysis.

The Q-Sample of 24 statements has been developed from talks with specialists and people engaged in earthquake prevention activities and research. (For the detailed materials, a list of statements and instructions, see the appendix)

The participants were given those 24 statements and were asked to read them carefully and divide them into 3 groups: 1- "I agree-I think so", 2- "I do not agree, I do not think so", 3-neutral – "I do not care/do not know". After that they were given the sheet of paper with the table (see appendix) and small pieces of paper with one statement written down on each and were asked to prioritize them by putting one statement into one cell. The participants could change their mind while doing the exercise and easily change the position of the statements in the table to adjust the statements positioning to their views.

#### 4. Results

After performing q-factor analysis three factors which are considered to characterize the types of attitudes related to furniture fastening (see Table 1 Factor Matrix).

Table no. 1 Factor matrix

**Factor Matrix with an X Indicating a Defining Sort**

QSort	Loadings:	1	2	3
1	0.6938X	0.2165	0.1839	
2	-0.1724	0.4739	0.7013X	
3	0.2903	0.1250	0.7198X	
4	0.6248	0.0324	0.6712X	
5	0.0748	0.8031X	0.2111	
6	0.7408X	-0.1873	0.3940	
7	0.1173	0.5808X	0.4927	
8	0.4638	0.6031X	0.3741	
9	0.6081	0.0980	0.6966X	
10	0.5274	0.4744	0.2869	
11	0.8113X	0.3953	0.0701	
12	0.5632	0.5087	0.3577	
13	0.7983X	0.3660	-0.1042	
% expl.Var.	31	19	21	

Using PQMethod software designed for Q-factor analysis, on the beginning we obtained eight factors as shown in table no. 1. These raw data does not provide enough information for patterns of subjectivity and there fore needs further analysis. That is why the next procedure is rotation of the factors which may be performed manually or using VARIMAX which is a one of the automatic functions of the PQMethod software a procedure that maximizes the variance explaining the factors. In our case the factor rotation was performed manually by the researcher. The results of factor rotation are shown in Table 1.

Another output of Q-Factor Analysis is a list of distinguishing statements for each factor. In other words each factor differs from the other factors by the set of statements that are characteristic to it. Each factor consists of the individuals whose way of thinking (selecting statements) was similar and statistically significant.

Factor 1 (for the full result of analysis, see appendix)

The distinguishing statements for factor 1 are following:

Agree:

1. I realize that the coming earthquake may affect me and my family, so that by having furniture fixed we can survive.
13. If I move or buy new furniture I would consider FF (Furniture Fastening).
3. I know where the devices for FF are being sold.
7. FF scratches my furniture.
24. FF looks bad.

Disagree:

15. I do not want anybody to come into my house and fastening my furniture to the wall because it disturbs my privacy.
10. Moving furniture is difficult (troublesome).

Respondents from this cluster are interpreted to represent *Optimist* attitudes. Even they agree that furniture fastening looks bad and may scratch the furniture, they know where to buy and they realize that coming earthquake is real and by having furniture

fastened they can survive. Even they can't carry out furniture fastening by themselves, there is no problem of privacy violation in case they need to ask professional technicians to fasten their furniture. Troublesome moving of furniture is really a barrier that makes them not to carry out the furniture fastening. Despite of such troubles those people who come under this cluster are quite active and they seem to believe in furniture fastening as an effective way to get prepared for earthquake occurrence.

From the point of view of disaster risk manager this group does not need much attention to be paid. This group of people are proactive and self sufficient.

## Factor 2

Agree:

15. I do not want anybody to come into my house and fix my furniture to the wall because it disturbs my privacy.

18. Even an earthquake happens; I think my house will not be damaged so I do not need FF.

3. I know where the devices for FF are being sold.

Disagree:

1. I realize that the coming earthquake may affect me and my family, so that by having furniture fixed we can survive.

Unlike the previous one, people from this cluster highly value their privacy and they are not fond of having technical professionals enter their house and fix their furniture to the wall. They do not believe that earthquakes will always affect their house. They are not interested in furniture fastening and therefore they do no care where the devices are being sold. This group of people do not believe that thanks to furniture fastening their family may survive. We can call this group *Unbelievers*. They do not tend to get prepared because they simply do not believe that earthquakes may affect their lives.

From risk management point of view this people will need careful attention and, therefore much effort and recourses to be targeted to change their behaviors.

## Factor 3

Agree:

6. I wish if I could but can't execute it by myself.

1. I realize that the coming earthquake may affect me and my family, so that by having furniture fixed we can survive.

9. I do not have tools to do FF.

21. FF is difficult because I have a lot of stuff in my house.

Disagree:

3. I know where the devices for FF are being sold.

4. I can do FF fast and easily by myself.

23. I do not need to do FF because there is no furniture in my bedroom.

15. I do not want anybody to come into my house and fix my furniture to the wall because it disturbs my privacy.

The above-mentioned third cluster represents people who wish to fasten their furniture but for some reason do not carry it out even if they realize that it may save their lives.

The major reasons for inactivity are: not having tools on hand, difficulty to move and fix furniture due to much stuff occupying space in the house, having no information available where devices are being sold.

They agree that they need furniture fastening in their bedrooms and they don't feel their privacy may be disturbed if some technicians will come into their houses. Let us call this group *Lazy*

This group is worthy to work on for the risk manager. Those people seem to be willing to carry out furniture fastening, however for several reasons mentioned above they do not do it. In this case the role of manager is to help them, and to facilitate their behavioral change, by providing essential information and assistance.

## **5. Conclusion**

In this paper we proposed QMethod as the technique useful for characterization of the attitudes regarding certain phenomena, furniture fastening – in our case, this method has proved to be potentially useful in the assessment phase of the management process by providing information about types of attitudes toward

certain phenomena.

The above analysis can be used to strategically examine implementation policies regarding FF for earthquake preparedness. The proposed approach has been found to address the question: What kind of support is needed by whom if any? It would be not effective and thus waste of time for those who intend to take an initiative in delivering information about furniture fastening, mainly to those who already carried out (Optimists) or to those who will probably never change their attitude (Unbelievers).

Importantly, the above findings are limited to the views and perceptions of “professionals”. We should also note that even among such professionals there are those who do not believe in the effectiveness of furniture nailing.

The future research will focus on comparing the attitudes toward furniture fastening between “professionals” , and “non-professionals” aiming to find the eventual differences/similarities in the perception of risk preparedness activities between the two groups, in order to facilitate better risk communication about furniture fastening.

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## Appendix

## References

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Distinguishing Statements for Factor 1

(P < .05 ; Asterisk (\*) Indicates Significance at P < .01)

Both the Factor Q-Sort Value and the Normalized Score are Shown.

No. Statement	No.	Factors					
			1	2	3		
		RNK	SCORE	RNK	SCORE	RNK	SCORE
1 I realize that the coming earthquake may affect me and my fa	1	4	1.96	-1	-0.29	3	1.27
13 If I move or buy new furniture I would consider FF.	13	3	1.36*	-3	-1.06	-1	-0.39
3 I know where the devices for FF are being sold.	3	2	1.35	0	0.47	0	-0.32
7 FF scratches my furniture.	7	1	0.06*	4	1.44	2	1.10
24 FF look bad.	24	0	0.04*	3	1.22	2	1.10
15 I do not want anybody to come to my house and fasten my furn	15	-1	-0.40	2	0.62	-2	-1.08
10 Moving furniture is difficult(troublesome).	10	-2	-0.52*	2	0.68	2	1.08

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Distinguishing Statements for Factor 2

(P < .05 ; Asterisk (\*) Indicates Significance at P < .01)

Both the Factor Q-Sort Value and the Normalized Score are Shown.

#### Distinguishing Statements for Factor 2

(P < .05 ; Asterisk (\*) Indicates Significance at P < .01)

Both the Factor Q-Sort Value and the Normalized Score are Shown.

		Factors					
		1		2		3	
No.	Statement	RNK	SCORE	RNK	SCORE	RNK	SCORE
15	I do not want anybody to come to my house and fasten my furn	-1	-0.40	2	0.62*	-2	-1.08
18	Even the earthquake happens; I think my house will not be da	-2	-0.66	1	0.60*	-1	-0.63
3	I know where the devices for FF are being sold.	2	1.35	0	0.47	0	-0.32
1	I realize that the coming earthquake may affect me and my fa	4	1.96	-1	-0.29*	3	1.27

#### Distinguishing Statements for Factor 3

(P < .05 ; Asterisk (\*) Indicates Significance at P < .01)

Both the Factor Q-Sort Value and the Normalized Score are Shown.

		Factors					
		1		2		3	
No.	Statement	RNK	SCORE	RNK	SCORE	RNK	SCORE
6	I want to do but I can't.	1	0.25	-1	-0.24	4	1.30*
1	I realize that the coming earthquake may affect me and my fa	4	1.96	-1	-0.29	3	1.27
9	I do not have tools to do FF.	0	-0.38	0	-0.03	1	1.06*
21	FF is difficult because I have a lot of stuff in my house.	-3	-1.04	-3	-1.05	0	0.15*
3	I know where the devices for FF are being sold.	2	1.35	0	0.47	0	-0.32
4	I can do FF fast and easily by myself.	2	0.64	1	0.51	-1	-0.67*
23	I do not need to do FF because there is no furniture in my b	1	0.09	3	0.74	-2	-0.76
15	I do not want anybody to come to my house and fasten my furn	-1	-0.40	2	0.62	-2	-1.08

Path and Project Name: C:\PQMETHOD\PROJECTS/d2

## 「専門家」の家具固定に対する態度：岸和田市における事例研究

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### 要旨

家具転倒防止は、簡単で費用もあまりかからない地震被害予防策である。しかしそれにもかかわらず一般にあまり普及していない。本研究はその背景にある原因を科学的に分析し、特性化するための方法を提案する。用いたQ-Method は、因子分析をベースにして、人々の主体的な態度・行動・動機付けについての要因を分析し、それに基づいて人々のタイプわけの情報を導くものである。大阪府岸和田市のケーススタディを通して、防災に携わる専門家の見方として、「楽観者」、「懐疑者」、「怠惰者」の三通りのタイプの人がいることが見いだされた。本研究で提案したアプローチを活用すれば、誰に照準を当ててどのような支援をすれば良いかについて政策情報が得られることが示された。最後に、本研究の適用の可能性と限界、ならびに今後の研究の必要性について言及した。

**キーワード** 家具転倒防止、態度、行動、地震への備え、Q-Method